

## LCA Activities in New Zealand

### Second LCA Workshop/Roundtable, Rotorua, Scion, NZ, February 2006

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The second LCA workshop/roundtable in New Zealand was hosted in February 2006 at Scion in Rotorua, New Zealand. Since the first LCA workshop in 2005 (Nebel and Nielsen 2005), a number of new LCA projects have been initiated in New Zealand, and a growing need for communication between LCA practitioners has resulted from this. The aims of this workshop were to get informed about new projects, to discuss possible normalisation and weighting methodologies for New Zealand and to formalise the LCA group in New Zealand.

The presented projects ranged from an LCA study for the dairy industry, the application of LCA in the design process of office furniture, LCA work of building materials and a case study on decking products.

CLAUDINE BASSET (AgResearch) talked about 'Accuracy of LCA results applied to farming systems in NZ'. Based on the LCA of milk production in NZ, the main issues for applying LCA to farming systems in NZ were highlighted. A first picture of the total environmental performance of milk production from a typical NZ dairy farm system, using LCA, was elaborated and compared to European LCA studies. Five potential impacts were assessed per kg of milk produced at the farm gate and per ha of land use. In this first assessment, compared to Swedish and German conventional dairy farm systems, the NZ system had threefold lower eutrophication and acidification potentials per kg of milk, twofold lower energy and land use, and a 50% to 80% lower global warming potential. Even compared to Swedish and Germany organic farm systems, its potential impacts per kg of milk were similar or most often lower. This can be explained by a farming system almost entirely based on high-producing perennial pastures and all-year grazing compared to European farming systems with high supplementary feed use. However, the comparison of LCA studies remains an uncertain and difficult exercise given the different models, assumptions and value choices used in each of them. A need was identified for harmonizing the LCA methodology applied to farming systems between different research teams of the world. While applying LCA to milk production in NZ, the lack of specific NZ inventory databases was also highlighted. Most of the time, the European and Australian databases were used by default. Another important problem was the lack of specific NZ characterization models for

regional impacts such as eutrophication. To improve the accuracy of LCA studies for farming systems, it would be critical to take into account the sensitivity of New Zealand ecosystems in assessing eutrophication. Finally, it was highlighted that LCA studies should be systematically associated with an uncertainty analysis which still requires some further research to become a practical part of LCA studies.

GAYA GAMAGE (Formway Furniture Ltd.) presented the study 'Developing the use of environmental impact assessment in commercial organisations: A case study of Formway Furniture'. Formway Furniture is an office furniture manufacturer/designer based in Wellington, New Zealand and is committed to achieving sustainable business. This project focuses on determining environmental impacts of four Formway products: the LIFE chair, FREE and GRID desks, and TRAF-FIC storage unit using LCA. The project investigated the application and utility of implementing LCA in an organisation such as Formway (both as a furniture manufacturer and as an organisation based in New Zealand). LCA is a method to assess environmental impacts at each stage of a product's life cycle. The technique was found to have several limitations for this application including the unavailability of data and data integrity. Due to the complexity of product components and available time to compile data, the LCA studies were streamlined to include the main material components of each product. It was found that the environmental impacts of the products varied according to material, processing methods and disposal scenario. In addition to determining the environmental burdens of each product, the project also assisted in compiling valuable data on Formway products and processes including investigation of the cleaner production efforts and environmental stance of Formway's supply chain. Such data is essential in the subsequent path towards sustainability.

ROMAN JAQUES (BRANZ Ltd.) talked about the Zero and Low Energy Houses (ZALEH) project which is a four-year FRST funded research project on market transformation and lifestyle evaluation of energy efficiency programmes. This programme will improve living conditions and thermal performance of the New Zealand housing stock by providing tools and guidelines for assessing the suitability of new energy efficiency technologies. As a subset of the BRANZ Ltd Zero and Low Energy Household project, BRANZ Ltd are

working on providing a life-cycle based inventory of 12 low energy technologies for New Zealand houses, examining the net resulting embodied and operational-related energy requirements and their associated CO<sub>2</sub> emissions only. Three time frames examined at 50, 100 and 150 years. The 12 materials/technologies were selected by an expert group. The 'low energy' technologies to be examined are: wood fibre insulation, high efficacy lights, high efficiency refrigeration, aspirated solar air heaters, co-generation, straw bale, straw clay, adobe, phase change materials, solar hot water, photovoltaics, wind generation. This study has yet to be completed.

BARBARA NEBEL (Scion) gave an overview of a current LCA project on decking products which is used in the 'Acceptable Biomaterials' project in order to develop a model for the dialogue between stakeholders. The 'Acceptable Biomaterials Programme' is a multidisciplinary project (funded by the Foundation for Research and Technology) which uses LCA methodology combined with social impact studies to provide an informed dialogue and decision-making process for new technologies. The intended outcome of this programme is to develop an 'acceptability threshold' positional model for bio-based technologies that incorporates environmental, social and ethical concerns impacting on the design and development of next generation products and technologies. This model will be based on the case study of pine decking products, looking at one existing product which is treated with copper, chrome and arsenate (CCA), and two emerging technologies which do not rely on chemical treatment; thermally treated pine and acetylated pine. An LCA on these three products and more than 100 stakeholder interviews have been completed. The outcome of the interviews and the LCA study has been discussed with stakeholders.

After the presentations of specific projects, the group discussed the need for a more formal LCA platform in New Zealand. As a first step to formalise the LCA group, a steering group with 6 members from industry, research organisations, academia, consultancy and design has been set up:

- Barbara Nebel, Scion
- Andrew Alcorn, Victoria University
- Claudine Basset, AgResearch
- Gaya Gamage, Formway

- Roman Jaques, BRANZ
- Andrew Barber, AgriLINK
- Tim Allan, Locusresearch

Main aims of the steering group are in the first instance:

- to develop a structure and purpose that adds value to members and the community
- to establish communications with all interested practitioners and industry
- the dissemination of LCA information and results to the wider NZ community

The overall aims of the LCA network will include:

- To increase education and awareness of LCA among stakeholders including industry, academia, government, non-government organizations, LCA practitioners, end users and the general public.
- To provide a platform for close exchange between LCA practitioners in New Zealand, for discussion but also collaboration on research projects and funding proposals
- To promote and foster the appropriate application of LCA in New Zealand
- To promote product-orientated environmental work in companies (Life Cycle Assessments and other Environmental Management Systems).
- To promote and foster the responsible development and application of LCA methodology in New Zealand and internationally with a view to making a positive contribution to Sustainable Development
- To promote networking among LCA practitioners and researchers nationally and internationally.
- To develop a national competence in LCA to meet the environmental challenges both locally and internationally

## Reference

- Nebel B, Nielsen PS (2005): LCA Workshop/Roundtable, Rotorua, Forest Research, NZ, February 2005. *Int J LCA* 10 (5) 375–376

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